The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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*Ex parte* STEPHEN FRANCIS RUTKOWSKI,
CANAN USLU HARWICKE,
MICHAEL FRANCIS XAVIER GIGLIOTTI and
MELVIN ROBERT JACKSON

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Appeal 2007-2909
Application 10/622,063[1]
Technology Center 1700

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Decided: 12 September 2007

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Before JAMESON LEE, RICHARD TORCZON, and SALLY C. MEDLEY, *Administrative Patent Judges*.

MEDLEY, *Administrative Patent Judge*.

## DECISION ON APPEAL

### A. Statement of the Case

Applicants appeal under 35 U.S.C. § 134 from a final rejection of claims 1-3, 11 and 24. We have jurisdiction under 35 U.S.C. § 6(b).

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1 Application for patent filed 17 July 2003. The real party in interest is General Electric Company.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

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| Ishida | US 5,932,012 | Aug. 3, 1999 |
| Chikahisa | WO 99/49987 | Oct. 7, 1999 |
| Barrey | US 6,197,115 | Mar. 6, 2001 |
| Chikahisa | US 6,562,406 | May 13, 2003 |

Claims 1-3, 11 and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishida in view of Barrey and either Chikahisa (US 6,562,406) or Chikahisa (WO99/49987) (Final Rejection 2 and Answer 4[2]).

## BACKGROUND

The invention is related to a robotic pen for writing a material atop a workpiece. The workpiece is mounted on top of a stage for rotation and orthogonal translation. The stage permits translation generally in a plane and rotation about an axis generally parallel to the plane. Specifically, the workpiece may be translated in a first linear axis X and a second linear axis Y for a two-plane translation of the workpiece (Specification ¶ 0018). A spindle 32 is mounted on the stage for rotation of the workpiece about an axis A, which is parallel to the two-plane X-Y axes (Specification ¶¶ 0019, 0052-0053 and Figs. 1 and 2). A controller coordinates the movement of the pen tip and the stage to dispense the material from the pen tip to the workpiece.

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2 Claims 4-6, 12, 17-23, 25, and 26 have been objected to as being dependent upon a rejected claim, but indicated allowable if rewritten in independent form (Final Rejection 5 and Answer 2).

**B. Issue**

The issue is whether Applicants have shown that the Examiner erred in determining claims 1-3, 11 and 24 to be unpatentable over the prior art as applied by the Examiner.

**C. Findings of fact ("FF")**

The record supports the following findings of fact as well as any other findings of fact set forth in this opinion by at least a preponderance of the evidence.

1. Applicants' claims 1-3, 11 and 24 are the subject of this appeal.

2. Independent claims 1, 11 and 24 are reproduced as follows:

1. A robotic pen comprising:

a machine including a stage for mounting a workpiece for rotation and orthogonal translation, the said stage permitting translation generally in a plane and rotation about an axis generally parallel to said plane, and an elevator for translation from said stage;

a pen tip rotatably mounted to said elevator;

a dispenser joined in flow communication with said pen tip for ejecting a stream of material atop said workpiece; and

a digital controller configured for coordinating relative movement of said pen tip and said stage, and dispensing of said stream from said pen tip.

11. A robotic pen comprising:

a computer numerically controlled machine including a stage for mounting a workpiece for rotation and orthogonal translation, the said stage permitting translation generally in a plane and rotation about an axis generally parallel to said plane, and an elevator for translation from said stage;

a pen tip rotatably mounted to said elevator;

a dispenser joined in flow communication with said pen tip for ejecting a stream of material atop said workpiece.

24. A robotic pen comprising:

a machine including a stage for mounting a workpiece for rotation and orthogonal translation, the said stage permitting translation generally in a plane and rotation about an axis generally parallel to said plane, and an elevator for translation from said stage;

a pen tip rotatably mounted to said elevator for rotation about an axis generally parallel to said plane;

a dispenser joined in flow communication with said pen tip for ejecting a stream of material atop said workpiece; and

a digital controller configured for coordinating relative movement of said pen tip and said stage, and dispensing of said stream from said pen tip.

*Ishida*

3. The Examiner found that Ishida describes (Fig. 1) a stage (items 5, 6, and 8), an elevator (items 4a and 10), a pen tip (nozzle 1), a dispenser

(syringe 2 and nozzle support 12) and a digital controller (items 14, 16, 17 and 18) (Final Rejection 2 and Answer 4).

4. The Examiner found that Ishida does not describe that the pen is rotatably mounted to the elevator, or that the stage permits translation generally in a plane and rotation about an axis generally parallel to the plane as recited in the claims (Final Rejection 2 and Answer 4).

*Barrey*

5. The Examiner relied on Barrey as describing an end effector gripping tool 16 for permitting translation generally in a plane and rotation about an axis generally parallel to the plane as claimed (Final Rejection 3-4 and Answer 4 and 6).

6. Specifically, the Examiner found that Barrey describes a multi-axis robot structure that allows for the application of sealant to a surface that lies in two or more dimensional planes, directing attention to Barrey, col. 2, lines 54-57 (Final Rejection 3 and Answer 4).

7. Barrey describes the following:

> As will be discussed in greater detail below, six of the seven axial control ports associated with robot controller 18 are used for controlling the six axes of motion of the robotic manipulator 14. Thus, in the present implementation, all six axes of motion provided by the robotic manipulator 14 are utilized so that the end effector or gripping tool 16 has a complete range of motion within a three-dimensional coordinate space. As will be appreciated, this complete range of motion becomes important when applying sealant to surfaces which lie in two or more dimensional planes, and a smooth and consistent robotic motion is required. (Barrey 2:47-57).

8. The Examiner concluded that it would have been obvious to use the robot end effector gripping tool (stage) 16 in Barrey for the X-Y table of Ishida in order to apply sealant to a surface that lies in two or more dimensional planes (Final Rejection 3 and Answer 4).

*Chikahisa (either the US or WO)*

9. The Examiner relied on either of the Chikahisa US patent or WO publication (collectively, Chikahisa) as describing a pen that is rotatably mounted to an elevator (Final Rejection 3 and Answer 5).

10. Specifically, the Examiner found that Chikahisa discloses a syringe and nozzle applying device with a member rotating device (item 230) to rotate the nozzles for application (Final Rejection 3 and Answer 5).

11. The Examiner concluded that it would have been obvious to use the Chikahisa rotary mount to achieve better control over nozzle positioning shifts during dispensing (Final Rejection 3 and Answer 5).

*Applicants' Arguments*

12. Applicants do not dispute the Examiner's findings with respect to Ishida and Chikahisa.

13. Applicants dispute, however, that Barrey describes that the robotic manipulator is rotatable about an axis generally parallel to the translational plane as found by the Examiner (Br. 6-10).

*The Examiner's Response*

14. The Examiner argued that Barrey describes a six axis robot and that such a robot is inherently capable of permitting translation in a plane and rotation about an axis generally parallel to a plane, citing as examples of such robots to be found in US Patents 6,039,375; 5,890,656; 5,833,147; 5,777,267 (Answer 7-8).

15. The Examiner further argued that the Barrey end effector must be able to rotate in order to manipulate the tool as described, e.g., in three dimensions, and in order to maintain the substrate in proper relationship to the stationary dispenser (Answer 8).

**D. Principles of Law**

A claimed invention is not patentable if the subject matter of the claimed invention would have been obvious to a person having ordinary skill in the art. 35 U.S.C. § 103(a); *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 82 USPQ2d 1385 (2007); *Graham v. John Deere Co. of Kansas City,* 383 U.S. 1 (1966).

Facts relevant to a determination of obviousness include (1) the scope and content of the prior art, (2) any differences between the claimed invention and the prior art, (3) the level of skill in the art and (4) any relevant objective evidence of obviousness or non-obviousness. *KSR*, 82 USPQ2d at 1388, *Graham*, 383 U.S. at 17-18.

**E. Analysis**

The Examiner finally rejected claims 1-3, 11 and 24 under 35 U.S.C. § 103(a) as being unpatentable over Ishida in view of Barrey and either Chikahisa (US 6,562,406) or Chikahisa (WO99/49987) (collectively referred to as "Chikahisa"). Applicants argue claims 1-3, 11 and 24 together as a group (Br. 6 and 10).

Applicants do not dispute the Examiner's findings with respect to what Ishida and Chikahisa describe. Applicants' argue, however, that Barrey does not describe that the robotic manipulator is rotatable about an axis generally parallel to the translational plane as found by the Examiner (FFs 12-13).

Independent claims 1, 11, and 24 recite a machine including a stage for mounting a workpiece for rotation and orthogonal translation. The stage permits translation, e.g., movement, generally in a plane and "rotation about an axis *generally parallel to said plane*" (emphasis added). This is seen, for example, in the Specification Figs. 1 and 2, where the plane of translation is defined as a first linear axis X and a second linear axis Y for a two-plane translation of the workpiece on the stage 18 (Specification ¶ 0018). A spindle 32 is mounted on the stage for rotation of the workpiece about an axis A, which is parallel to the two-plane X-Y axes (Specification ¶¶ 0019, 0052-0053 and Figs. 1 and 2). Thus, the spindle 32 allows rotation of the workpiece about an axis A which lies along a different plane than the X-Y plane, but one that is generally parallel to the X-Y plane.

The Examiner found that Barrey describes a stage, e.g., end effector gripping tool 16, which permits translation generally in a plane. The Examiner did not specifically find where Barrey describes rotation about an axis that is parallel to the plane defined by the end effector. Rather, the Examiner has taken the position that since Barrey describes a six axis robot, that such robot inherently is capable of being moved in any direction and would be capable of rotating about an axis that is parallel to the plane defined by the end effector gripping tool 16. The Examiner directs our attention to several patents to support the assertion that a six axis robot is capable of being moved in any direction (FFs 5-7 and 14-15).

The Examiner has failed to demonstrate that the Barrey end effector permits translation generally in a plane and rotation about an axis *generally parallel to the plan*e. We understand the Examiner to rely on the end effector gripping tool 16 as defining the plane of translation. That is, the end effector gripping tool 16 defines a plane of translation in at least, for example, the Y direction to move or translate the workpiece in towards pen 40. Even if the Examiner is correct that the end effector gripping tool 16 inherently is capable of being rotated in any direction, such rotation would be about an axis in *the same plane* of, and not in a plane that *is generally parallel to*, the plane defined by the end effector gripping tool. We read "generally parallel to" as excluding "the same as." Also, in the context of the claimed invention, the translational motion plane is independent of rotational motion.

Therefore, the Examiner has failed to sufficiently establish that Barrey

describes a stage which permits translation generally in a plane and "rotation about an axis generally parallel to" the plane as recited in independent claims 1, 11 and 24. As applied by the Examiner, neither Ishida nor Chikahisa make up for the deficiencies of Barrey. The Examiner's rejections are reversed.

**E. Decision**

Upon consideration of the record, and for the reasons given, the Examiner's rejections are reversed.

The Examiner's rejection of claims 1-3, 11 and 24 as being unpatentable under 35 U.S.C. § 103(a) over Ishida in view of Barrey and either Chikahisa (US 6,562,406) or Chikahisa (WO99/49987) is reversed.

REVERSED

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